

Proposed curriculum for Bachelor of Science course- B.Sc. Medical Technology (Renal Dialysis Technology)

At Indira Gandhi Medical College, Shimla (HP)-171001. Affiliation to Himachal Pradesh University, Shimla.

1. Title of the Course

Bachelor of Science in Medical technology- Renal Dialysis Technology [BSc. Renal Dialysis Technology]

2. Eligibility for admission:

i) A candidate must have passed 10+2 examination of any recognised board with medical group with 50% marks in aggregate including English and 40% marks in case of SC/ST candidates. Provided that for in-service candidates they must have passed 10+2 examination of any recognised board with science.

ii) AGE

A candidate should have attained minimum age of 17 years and maximum age of 25 years as on 31st December of the year concerned.

Provided that the maximum age limit shall not be applicable in case of in-service candidates.

3. Duration of the course:

The duration of course will be three academic years (36 months) and the examination shall be conducted/held on annual basis in the month of July/August followed by supplementary examination to be held in November/December for which the dates are to be notified by the controller of examinations of the Himachal Pradesh University, Shimla-5.

4. NUMBER OF SEATS & ADMISSION

Ordinarily the admission for regular session will be held in the month of July/August. There will be total of 05 seats. 04 Seats will be filled up on the basis of competitive entrance test/examination to be conducted by the agency to be notified by the Government of Himachal Pradesh. The remaining 01 seat in the course shall be filled up from amongst the in-service candidates of the department of health services, of the government of Himachal Pradesh for which the criteria shall be determined by the government of Himachal Pradesh (Health deptt.) and other reservation of the seats shall be as per the H.P. government instructions.

5. Syllabus and method of training:

The course and syllabus of studies shall be such as prescribed by the board of studies/ faculty from time to time.

Examination shall be held twice in a year, annual in July/August and supplementary in November/ December. It will consist of:

Theory	200 marks
Practical	100 marks
Viva-voce	50 marks
Internal assessment	50 marks

6. Medium of instruction:

The medium of instruction and examination shall be in English.

5. Scheme of examination:

There will be four examiners:

- Two internal and two external.
- No person will be appointed examiner in any of the subjects unless he/she has five years teaching experience in the concerned speciality.
- Senior internal examiner will be the co-ordinator of the board of examiners and he/she will also act as moderator.
- 1st and 2nd paper will be set by the external examiners and 3rd and 4th paper will be set by internal examiners.

50 marks will be for internal assessment and these marks will be added to the final practical examination in each academic session. For the purpose of internal assessment head of the department will arrange periodical tests in theory and practical after every three months.

Candidates will be required to pass in all the papers in every academic session obtaining 50% minimum marks in each individual subject and separately in total theory and total practical.

There shall be three examinations one each at the end of 1st, 2nd and 3rd year.

Candidates who fail to qualify in the annual examination will be permitted to appear in the supplementary examination. During this period he/she will be provisionally allowed to join the higher class.

However, if he/she fails to qualify all the papers in supplementary examination, he/she will not be promoted to the next academic year.

Result will be declared by H.P. University after each academic session.

The annual examination for the first, second and third year courses will be held by H.P. University during July/August. For those who do not pass the examination, a supplementary examination will be held in November/December every year.

The students shall submit his/her application for admission to the examination to Registrar, H.P. University on the prescribed form with the required fee and certificates regarding the satisfactory completion of training by the candidate duly signed by the head of department.

The examination for the first, second and third year of B. Sc. Renal dialysis technology course would be held according to the prescribed syllabus.

The examination for each session will consist of four theory papers carrying 50 marks each. The title of these papers for each session/part are given in annexure.

Each theory paper will have 12 questions of which the candidates will have to attempt 10 including compulsory questions.

Internal assessment: it will be of 50 marks in each academic year which will be added to the marks of practical examination in the final examination of each year.

Practical and viva-voce examination: The Practical and viva-voce examination will be held for all three academic year. The practical and viva-voce examination in each year will carry 150 marks (100 practical+50 for viva). It will be comprehensive and will cover the whole course. Despite all three annual examinations the candidate will have to obtain 50% separately in theory and practical plus viva-voce +internal assessment.

The successful candidates shall be classified, as under on the aggregate marks obtained in the first, second and third year examination taken together:

- | | |
|---|-----------------|
| a) Those who obtain 60% or more in aggregate: | first division |
| b) Those who obtain 50% or more but below 60% of the aggregate marks: | second division |

Board of examiners: the board of examiners (including subjects) will consist of two external and two internal examiners. The external examiners will set the first and second question papers and also evaluate the answer sheets and conduct the practical and viva-voce examinations. The coordinator/head of the department will also be the convenor-cum-senior internal examiner. No person shall be appointed as examiner in any of the papers/subjects unless he/she has at least five years teaching experience in the concerned speciality.

Supplementary examinations:

A student will have to obtain 50% marks in each individual paper, if he fails to obtain 50% in any of the papers he will be permitted to appear in supplementary examinations. During this period he will be provisionally allowed to join the higher class. However, in case he fails to qualify all the papers in supplementary examination he will not be promoted to the next academic year.

A failed student appearing in the supplementary or annual examination shall:

- a) Be required to pay examination fee as for the whole examination.

6. Attendance

Every candidate should have attended at least 75% theory and 75% of practical demonstrations for making him/her eligible to appear in the examination in each year otherwise students will be detained.

Candidates should have 50% marks in internal assessment for making him eligible to appear in the examination.

The degree of BSc renal dialysis technology will be awarded to the candidates only after he/she has completed the following:

- a) Has passed all the three annual examinations.
- b) Has satisfactorily completed the full period of training of three years and
- c) His/her work and conduct during the period of training have been satisfactory.

The registrar shall publish the result of the examination as soon as possible after the examination has been held.

TABLE - I DISTRIBUTION OF SUBJECTS AND LECTURES IN B Sc (RDT)

FIRST YEAR	SUBJECT	LECTURE	DEMONSTRATION
	1.APPLIED HUMAN ANATOMY	25	10
	2.APPLIED HUMAN PHYSIOLOGY	25	10
	3. APPLIED BIOCHEMISTRY	25	10
	4. RENAL NURSING PROCEDURES, TECHNIQUES & NUTRITION	25	10
SECOND YEAR	1.PATHOLOGY	25	10
	2.MICROBIOLOGY	25	10
	3.PHARMACOLOGY	25	10
	4. COMMUNITY MEDICINE AND ENVIRONMENTAL SCIENCE	25	10
THIRD YEAR	1. APPLIED NEPHROLOGY	25	10
	2. APPLIED DIALYSIS I	25	10
	3. APPLIED DIALYSIS II	25	10
	4. DIALYSIS PRACTICES IN SPECIAL SETTINGS AND POISONING	25	10

Practical:

The practical and viva-voce examination will be conducted after every academic session on related topics covered in theory papers. The following topics will be specially covered in the practical till final year:

1. Haemodialysis
2. Peritoneal dialysis
3. Patient monitoring
4. Nursing techniques

During their training, the trainee will have to work in dialysis unit and required to assist in renal dialysis outside the dialysis unit. They will be assisting the nephrologists, residents, para medical staff and nursing staff during their tenure of training, which will mainly include, but not confined to:

1. Handling and maintaining dialysis machines.
2. Cleaning and sterilization of equipment.
3. Patient transportation, monitoring and securing vascular access.
4. Assisting staff in procedures and maintain records.

Examination system:

B.Sc part I

Paper 1 applied human anatomy.

Paper 2 applied human physiology.

Paper 3 applied biochemistry.

Paper 4 renal nursing procedures, techniques and nutrition.

B.Sc part II

Paper 1 pathology.

Paper 2 microbiology.

Paper 3 pharmacology.

Paper 4 community medicine and environmental science.

B. Sc part III

Paper 1 applied nephrology.

Paper 2 applied dialysis I.

Paper 3 applied dialysis II.

Paper 4 dialysis practices in special settings and poisoning.

DETAILED SYLLABUS OF SUBJECTS

FIRST YEAR

ANATOMY

Introduction to Anatomy

Basic Anatomical terminology: Definition of anatomy and its divisions, Terms of location, positions and planes, Cell and its organelles, Epithelium, Glands- classification, describe serous & mucous glands with examples.

Basic tissues - classification with examples.

Osteology - Upper limb – clavicle, scapula, humerus, radius, ulna, small bones of hand.

Lower limb - femur, hipbone, sacrum, tibia, fibula, small bones of foot

Vertebral column

Myology – Muscles of thorax, muscles of upper limb (arm & forearm), muscles of lower limb, Flexor and extensor group of muscles (origin, insertion, nerve supply, and action), muscles of back and abdomen.

Histology – Types of tissue

(a) Epithelia – Squamous, Glandular, Transitional.

(b) Connective tissue – bone, cartilage, fibrous tissue, muscle.

(c) Renal histology.

Nervous system- Neuron, Classification of nervous system, Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerves, Meninges, Ventricles & cerebrospinal fluid, Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk & names of parasympathetic ganglia.

Respiratory system (RS) – Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments, lung and pleura, Names of paranasal air sinuses, Intercostal space, pleura, bony thoracic cage, ribs, sternum & thoracic vertebrae.

Cardiovascular system – Surface anatomy of heart, chambers of the heart, valves of the heart, and major blood Vessels of heart, pericardium and coronary arteries, Systemic & pulmonary circulation, Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, Peripheral pulses, Inferior venacava, portal vein, internal jugular vein, femoral vein, portosystemic anastomosis, Great saphenous vein, Dural venous sinuses, Lymphatic system- cisterna chyli & thoracic duct .

Abdomen: surface anatomy, Parts of GIT, Oral cavity, tonsil, dentition, pharynx, salivary glands, Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas, organs their function and blood supply, peritoneum structure and function.

Excretory and reproductive system – Kidneys, ureters, bladder, structure of nephrons, male and female genital.

Skin and its appendages

Embryology: general and excretory system.

Reference books:

Chaurasia -A Text book of Anatomy

Snell- clinical anatomy for medical students

PHYSIOLOGY

- 1) **The Cell:** Cell Structure and functions of the various organelles. Endocytosis and exocytosis. Homeostasis. Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis).
2. **The blood:** Composition of Blood, functions of the blood and plasma proteins. Erythropoiesis, pathological and Physiological variation of the RBC. Structure, function and metabolism of Hemoglobin. Erythrocyte Sedimentation Rate. Detailed description about WBC. Platelets, coagulation of blood, anti-coagulants, bleeding disorders. Blood groups and Rh factor, plasma proteins.
- 3) **Cardio-Vascular System:** Physiological Anatomy of the heart, Heart sounds. Cardiac cycle, Cardiac output. Auscultatory areas. Cardiac murmurs. Blood pressure, Hypertension, Hormonal regulations for arterial pressure and determination of arterial Blood pressure. Electro cardiogram (ECG), applied physiology of coronary circulation. Foetal circulation, Circulatory shock.
4. **Respiratory system:** Physiological Anatomy of Respiratory tract. Respiratory movements. Definitions and Normal values of Lung volumes and Lung capacities. Measurement of Lung volumes and capacities. Exchange of Respiratory gases in the Alveoli. Transport of Respiratory gases in the blood. Artificial Respiration.
5. **Excretory system:** Urine Formation, Micturition, Renal function tests, renal disorders. Renal dialysis.
6. **Reproductive system:** Physiological Anatomy of the Male & Female Reproductive organs. Formation of semen and spermatogenesis. Brief account of menstrual cycle.
7. **Central Nervous system:** organisation and function of various parts of CNS, Functions of CSF. Significance of CSF Analysis.
8. **Endocrine system:** Functions of the pituitary, thyroid, parathyroid & bone metabolism, adrenal and pancreatic Hormones.
9. **Digestive system:** Physiological Anatomy of the GIT. Food Digestion in the mouth, stomach, intestine, Absorption of foods, Role of bile in the digestion

Reference books:

- Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book,
 Ganong (William F) Review of Medical Physiology. Latest Ed . Appleton

BIO-CHEMISTRY

Atomic structure

Dalton's theory, Properties of electrons, protons, neutrons, and nucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbit and orbital, Quantum numbers, Heisenberg's uncertainty principle, Valence and bonds

Biomolecules and the cell:

Major complex biomolecules of cell and cell organelles-Prokaryotic and eukaryotic cell

Carbohydrates

Chemical structure, function- Classification- Monosaccharides- Disaccharides- Polysaccharides- Homopolysaccharides-Heteropolysaccharides-Glycoproteins

Proteins:

Amino acids- Classification- Structure of proteins- Determination of protein structure- Properties of proteins- Denaturation- Classification of proteins- Antigen, Antibody- Types, and Plasma proteins- Blood clotting.

Lipids:

Chemical structure, functions, Classification-fatty acids, Triacylglycerol, Phospholipids, glycoproteins, Lipoproteins- Steroids - Amphipathic lipids.

Nucleic acids:

Purines and pyrimidine, Structure of DNA, Watson & Crick model of DNA, Structure and type of RNA.

Enzymes:

Definition – Nomenclature – Classification – Factors affecting enzyme activity –Active site – Coenzyme – Enzyme Inhibition – Mechanism of enzyme action – Units of enzyme – Isoenzymes – Enzyme pattern in diseases.

Vitamins & Minerals:

Introduction, classification, Fat soluble vitamins, Water soluble vitamins, principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur), Trace elements, Calorific value of foods, Basal metabolic rate(BMR), respiratory quotient(RQ), Specific dynamic action(SDA), Balanced diet – Marasmus, Kwashiorkor.

Hormones:

Classification – Mechanism of action – Hypothalamic hormones – Pituitary –Anterior, posterior – Thyroid – Adrenal cortex, Adrenal medulla – Gonadal hormones –Menstrual cycle – GI hormones

Acids and bases:

Definition, pH, Henderson – Hasselbalch equation, Buffers, Indicators, Normality, Molarity, Molality.

Specimen collection: Pre-analytical variables, Collection of blood, Collection of CSF & other fluids

Urine collection, Use of preservatives, Anticoagulants.

Introduction to Laboratory apparatus: Pipettes, Burettes, Beakers, Petri dishes, depression plates, flasks, Funnels, Bottles, Wash bottles, Measuring cylinders, Porcelain dish, Tubes, centrifuge tubes, test tube draining rack, Tripod stand, Wire gauze, Bunsen burner, Cuvettes, stop watch, scissors, Dispensers, cleaning of glass ware, cleaning of plastic ware, Water bath, Water Distillation plant and water deionisers. refrigerators, cold box, deep freezers, Reflux condenser, centrifuges, Svedberg unit, centrifugal force, centrifugal field, Laboratory balances, Direct read out electrical balances, Colorimeter and spectrophotometer, pH meter, Types of electrodes, Conventional and SI units

Urine analysis

Reference books:

Kaplan - Clinical chemistry

Das (Debajyothi) Biochemistry Latest ED Academic, Publishers, Calcutta - 1992

RENAL NURSING PROCEDURES, TECHNIQUES AND NUTRITION

1. Pre-operative preparation of patient.
2. Transportation techniques of patient.
3. Positioning of patient
4. Bed making
5. Injection techniques- intravenous, intramuscular, subcutaneous
6. Bladder catheterization
7. Insertion of intravenous cannula
8. Suturing material types and technique.
9. Collection of blood, urine and stool specimens and their aseptic transfer to the laboratory
10. Peritoneal dialysis (PD) exchanges
11. Assisting the physician in minor surgery: vascular access, etc
12. Removal of sutures
13. Cleaning and dressing of wounds and vascular access sites and peritoneal catheter exit site.
14. Sterilization, asepsis, techniques of sterilization
15. Handling of sterilized articles
16. Resuscitation
17. Documentation
18. Instrumentation: glucometer, cardiac monitor, pulse oximeter, Infusion pumps, ambu bag, ventilator, BP instrument, NIBP, ECG.
19. First -aid

RENAL NUTRITION

1. Introduction to science of nutrition
2. Food pattern and its relation to health
3. Factors influencing food habits, selection and food stuffs
4. Food selection, storage & preservation
5. Classification of nutrients – macronutrients and micronutrients
6. Proteins – types, sources requirements and deficiencies of proteins
7. Carbohydrates sources, requirements & efficiency
8. Fats – types, sources, requirements, deficiency and excess of fats
9. Water – sources of drinking water, requirements, preservation of water
10. Minerals – types, sources, requirements deficiencies of minerals

11. Vitamins – types, sources, requirements deficiencies of vitamins
12. Planning diets including renal diets.

Reference Books:

Principles and Practice of Renal Nursing-Paul Challinor, John Sedgewick

Renal Nursing, 4th Edition-Nicola Thomas

Nutritional Management of Renal Disease, Third Edition 3rd Edition -by Joel D. Kopple (Editor), Shaul G Massry (Editor), Kamyar Kalantar-Zadeh (Editor)

Handbook of Nutrition and the Kidney -by William E. Mitch (Editor), T. Alp Ikizler MD

Journal of Renal Nutrition - Elsevier

**SECOND YEAR
PATHOLOGY**

1. Introduction to pathology
2. Cellular adaptation, Cell injury & cell death: Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation. Causes of cell injury. Mechanisms of cell injury. Reversible and irreversible cell injury. Morphology of cell injury and necrosis. Apoptosis. Sub cellular responses to injury. Intercellular accumulations. Pathologic calcification. Cellular aging.
3. Inflammation: General features of inflammation, Historical highlights, acute inflammation, Chemical mediators of inflammation, Outcomes of acute inflammation, Morphologic patterns of acute inflammation& chronic inflammation, Systemic effects of inflammation, consequences of defective or excessive inflammation
4. Genetic disorders: Normal karyotype, Mutations, Mendelian disorders, multifactorial inheritance, Cytogenetic disorders, Single-gene disorders, Molecular diagnosis, Diagnosis of genetic diseases.
5. Immunity disorders: General features of the immune system, Disorders of the immune system.
6. Infectious diseases: General principles of microbial pathogenesis, Viral infections, Bacterial infections, Fungal infections & Parasitic infections.
7. Neoplasia: Definitions, Nomenclature, Biology of tumour growth, benign and malignant neoplasms, Epidemiology, Molecular basis of cancer, Molecular basis of multistep carcinogenesis, Carcinogenic agents and their cellular interactions, Host defence against tumours-Tumour immunity, Clinical features of tumours.
8. Environmental and nutritional disorders.9.
9. Classification of renal diseases
 - A. Glomerular diseases – causes, types & pathology
 - B. Tubulo-interstitial diseases
 - C. Renal vascular disorders
 - D. End stage renal diseases – causes & pathology
 - E. Pathology of kidney in hypertension, diabetes mellitus, pregnancy
 - F. Pathology of peritoneum – peritonitis – bacterial, tubular & sclerosing peritonitis
 - G. Pathology of urinary tract infections

H. Pyelonephritis & tuberculous pyelonephritis

I. Congenital abnormalities of urinary system

PRACTICALS

- Urine Examination: - Physical, Chemical, Microscopic.
- Blood Grouping Rh typing.
- Hb Estimation, Packed Cell Volume [PCV], Erythrocyte Sedimentation rate {ESR}
- Bleeding Time, Clotting Time.

Reference books:

Robbins and Cotran pathologic basis of disease

Todd & Sanford Clinical Diagnosis by laboratory method

Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi.

MICROBIOLOGY

1. Morphology: Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.
2. Growth and nutrition: Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.
3. Sterilisation and Disinfection: Principles and use of equipment of sterilization namely Hot Air oven, Autoclave, Pasteurization, Anti septic and disinfectants. Antimicrobial sensitivity test.
4. Immunology: Immunity, Vaccines, Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV, HCV and HbsAg.
5. Systematic Bacteriology: Morphology, diseases caused, laboratory diagnosis including specimen collection of the following bacteria: (the classification, antigenic structure and pathogenicity are not to be taught) Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococcal, C diphtheria, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes.
6. Parasitology: Morphology, life cycle, laboratory diagnosis of following parasites: E. histolytica, Plasmodium, Tape worms, Intestinal nematodes.
7. Mycology: Morphology, diseases caused and lab diagnosis of following fungi, Candida, Cryptococcus, Dermatophytes, opportunistic fungi.
8. Virology: General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses: Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.
9. Hospital infection: Causative agents, transmission methods, investigation, prevention and control Hospital infection.
10. Principles and practice of Biomedical waste management

Reference books:

Anathanarayana & Panikar Medical Microbiology

Chatterjee - Parasitology - Interpretation to Clinical medicine.

PHARMACOLGY

1. Introduction to pharmacology, IV fluid therapy with special emphasis in renal diseases.
2. Diuretics – classification, actions, dosage, side effects & contraindications
3. Anti-hypertensive – classification, actions, dosage, side effects & Contraindications, special reference during dialysis, vasopressors, and drugs used in Hypotension
4. Drugs & dialysis – dose & duration of administration of drugs
5. Dialyzable drugs – phenobarbitone, lithium, methanol etc.
6. Vitamin D & its analogues, phosphate binders, iron, folic acid & other vitamins Of therapeutic value.
7. Erythropoietin in detail
8. Heparin including low molecular weight heparin
9. Protamine sulphate

10. Formalin, sodium hypochlorite, hydrogen peroxide – role as disinfectants & adverse effects of residual particles applicable too formalin.
11. Haemodialysis concentrates – composition & dilution (acetate & bicarbonates)
12. Peritoneal dialysis fluid in particular hypertonic solutions – composition
13. Potassium exchange resins with special emphasis on mode of administration

Reference books:

Katzung basic and clinical pharmacology
Essentials of medical pharmacology-KD Tripathi

COMMUNITY MEDICINE AND ENVIRONMENTAL SCIENCE

1. Introduction to community medicine and public health
2. Epidemiology
3. Biostatistics
4. Family and community: The family, meaning and definitions, Functions & types of family, changing family patterns, Influence of family on individual's health, family and nutrition, the effects of sickness in the family, psychosomatic disease, rural community: Meaning and features, Health hazards to communities.
5. Population
6. National health programs
7. Communicable
8. Non-communicable diseases.
9. Nutritional disorders.
10. Bio hazard
11. Bio medical waste management.
12. Social Security: Social Security and social legislation in relation to the disabled
13. Social Work: Meaning of Social Work, The role of a Medical Social Worker.
14. Introduction to Environment and Health: health hazards and control of environmental pollution, The concept of safe and wholesome water: The requirements of sanitary sources of water, Understanding the methods of purification of water on small scale and large scale, Various biological standards, including WHO guidelines for third world countries, Concept and methods for assessing quality of water. Domestic refuse, sullage, human excreta and sewage their effects on environment and health, methods and issues related to their disposal. Awareness of standards of housing and the effect of poor housing on health. Role of arthropods in the causation of diseases, mode of transmission of arthropods borne diseases & methods of control.

Reference books:

B.K. Mahajan & M. Gupta (1995) Text Book of Preventive & Social Medicine, 2002, 17th Edition Jaypee Brothers.
Park textbook of preventive and social medicine

**THIRD YEAR
APPLIED NEPHROLOGY**

1. Acute renal failure
2. Nephrotic syndrome – primary & secondary
3. Nephritic syndrome
4. Urinary Tract Infection – urinary tract infections
5. Asymptomatic urinary abnormalities
6. Chronic Kidney Disease
7. Renal stone diseases
8. Obstructive nephropathies
9. Congenital & inherited renal diseases
10. Pregnancy associated renal diseases
11. Renal vascular disorders & hypertension associated renal diseases

DIALYSIS TECHNOLOGY PART I

1. History, types of Dialysis,
2. Principles of Dialysis, quantification of adequacy
3. Dialysis Team-rights-responsibilities-patient doctor relationship
4. Dialysis reuse
5. Dialyser Membranes
6. Vascular Access – Temporary & Permanent
7. Equipment – Accessories – Function
8. Computer applications in Dialysis
9. Dialysate delivery system
10. Composition of dialysate
11. High flux / high efficiency dialysis
12. Continuous Renal Replacement Therapy / Slow Low Efficiency Dialysis
13. Complications in dialysis patients
14. Water treatment-pre-treatment, deionizer, Reverse Osmosis
15. Quality control in dialysis
16. Renal data maintenance

DIALYSIS TECHNOLOGY PART II

1. Machine and patient monitoring during haemodialysis
2. Patient Assessment – Pre, intra & post dialysis
3. Lab data analysis
4. Acute and chronic dialysis prescription
5. Medications in dialysis patients
6. Nutrition management in dialysis patients
7. Anticoagulation
8. Infection control and universal precautions
9. Psychosocial aspects & patient education
10. Acute and Chronic Peritoneal Dialysis
13. History, access, physiology of Peritoneal Dialysis
14. PD – Transport kinetics, ultrafiltration, UF, Intermittent PD, Continuous Ambulatory Peritoneal Dialysis, Automated Peritoneal Dialysis, Dialysis Solutions, Novel uses of PD
15. Infectious and non-infectious complications of PD

DIALYSIS PRACTICES IN SPECIAL SETTINGS AND POSONING

1. Dialysis in special situations: Patients with congestive cardiac failure, Advanced liver disease, Patients positive for HIV, HBsAg & HCV, Failed transplant, Pregnancy, Preparation of dialysis patients for various surgical procedure and post-operative Dialysis support
2. Dialysis in infants & children.
3. Special dialysis procedures: Continuous therapies in haemodialysis, Different modalities of peritoneal dialysis, haemodiafiltration, Haemoperfusion, SLED, MARS, Plasmapheresis
4. Recent advances in haemodialysis: Nocturnal dialysis, online dialysis, Daily dialysis
5. Telemedicine in dialysis practice
6. Special problems in dialysis patients: Psychology & rehabilitation, Diabetes, Hypertension, Infections, Bone diseases, Aluminium toxicity, Renal Anaemia.
7. Renal transplant co-ordination: Recipient and donor workup, psychosocial and legal aspects, cadaver donor, Maintenance, principles of post-operative management and follow-up.
8. Principles of Intensive care: Monitoring and diagnostic procedures in ICU, General care of patient in ICU, Fluid management and parenteral nutrition, Infectious diseases in ICU, Respiratory Failure, Acid-base and electrolytes disorders, cardio vascular failure, liver failure, Head injury, principles of transfusion therapy, Ventilator maintenance.
9. An introduction to common Uro-surgical procedures & ESWL.
11. Basic and advanced cardiac life support
12. Extracorporeal management of poisoning.

Reference books:

1. Oxford textbook of Nephrology
2. The Kidney – Brenner (Vol I/II)
3. Diseases of the Kidney and the urinary tract – Schrier (Vol I, II, & III)
4. Textbook of Dialysis therapy – Nissenson
5. Textbook of Peritoneal Dialysis – Ram Gokal
6. Handbook of dialysis – John T. Daugirdas

List of Journals for dialysis therapy:

1. Kidney International
2. Nephrology, Dialysis, Transplantation
3. Seminars in Dialysis
4. Seminars in Nephrology